Patent Application of

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for

TITLE: MULTIPLE PERSON HAMMOCK SHELTER WITH RETRACTABLE RAINCOVER

CROSS-REFERENCE TO RELATED APPLICATIONS

Not applicable.

BACKGROUND - - FIELD OF INVENTION

This invention relates to portable shelters, particularly a tent capable of being suspended above the ground having a retractable raincover.

BACKGROUND - - DISCUSSION OF PRIOR ART

Tents and hammocks have been used as temporary, portable shelters throughout history. Many different shelters have been developed in order to provide a refuge from inclement weather as well as from insects and animals. Problems are inherent with both types of structures. Unlike camping hammocks, tents are not dependent upon trees to be set up. This allows a greater choice in set up location. Tents being set directly on the ground however, are soiled easily, and are detrimental to the fauna on which they are placed. Also, several problems are inherent when laying on thin fabric placed directly on the ground, including contact with and accessibility to animals of all kinds, the seepage of water through holes or seams, difficulty in driving stakes, uncomfortable lumps and uneven terrain.

Shelters elevated above such a problematic surface are innately problematic themselves. Although hammocks provide a more comfortable, dry, and clean surface than tents do, they depend upon having

something to hang between. In addition, prior hammocks have suffered several problems, combinations of these plague all prior portable suspended surfaces. 1) Longitudinal sag causes undue strain on the lower back and adds pressure to one's heels causing pain and hyper-extensive pressure on the knees. 2) The shelter requires attachment to the ground or to objects at the side(s) of the shelter to stabilize the structure, or to spread the floor. 3) The lines used to suspend the shelter and maintain its shape easily become entangled. 4) The shelter is difficult and time consuming to set up and take down, requiring knot tying and retying, with trial and error adjustments in attempt to obtain proper tensions. 5) Most hammocks comfortably allow only one person, no matter how large the hammock is. When two people attempt to lie in a hammock simultaneously, both generally roll into the center. 6) Prior hammocks having a raincover do not allow room for individuals to stand upright in a closed vestibule area. 7) Hammocks having spreader bars do not collapse, making hiking or storage of such hammocks more difficult. 8) Hammocks with removable raincover canopies require users to exit the hammock in order to remove or apply the raincover.

SUMMARY

The present invention is a hammock capable of being used as a tent. Entrance into the shelter's vestibule is gained through zipper doors, located on opposite lateral sides of the raincover. Secondary entrance onto the hammock's surface is gained through the mosquito net zipper doors. These doors are located on both lateral sides of the mosquito net.

This bed includes a raincover that is tractable and retractable from inside enclosure by use of a string and clips. These are gained access to by way of a zipper door on either longitudinal end of the bed surface.

This bed comprises of a taut surface horizontally suspended between two spaced anchors, such as trees or the like, being done so through the mechanical advantage of a double pulley system created at one of the two ends. Secondly, this bed is spread laterally with the aid of collapsible spreader poles located at each longitudinal end of the bed. Thirdly, this bed is supported against lateral tipping and sway with the use of supports. These supports run from a secondary placement on the spaced anchors, to each of the four corners of the bed and are made adjustable with cam buckles.

This bed includes a collapsible tent pole framework supporting the mosquito netting as well as the raincover. This framework works independently of the spaced anchors used to suspend the bed. As a result of this independent framework, this bed may be used on the ground as a tent shelter.

OBJECTS AND ADVANTAGES

Accordingly, several objects and advantages of this invention are realized. Firstly, the invention as a hammock, with the use of a double-pulley suspension system, has removed longitudinal sag creating in essence a horizontal plane. This is done so in a way that the greatest tension runs through the longitudinal axis of the bed while diminishing slightly to the lateral sides. A result of the greater tension being through the longitudinal center of axis is that it affords each person the comfort of lying on his/her side without "log-rolling" toward the

center or each other. In addition, the invention, with the use of collapsible spreader-poles stretches the hammock laterally and removes lateral sag, thus adding to an individual's comfort. Further, if weight is placed on either lateral extreme of the bed surface, the hammock, while off balance from the main longitudinal axis, will not greatly tilt or sway. This is a result of the lateral stabilizer lines, which run from a higher position on the spaced anchors to the corners of the hammock. As a result of these lateral stabilizer lines, weight may be placed anywhere on the hammock without tipping it over.

Another advantage of this invention is that relatively few lines are used to secure and tension it, which prevents entanglement in storage. The main horizontal-tension lines are the only lines permanently attached to the hammock. The stabilizer lines are independent of the hammock. These are wrapped around the spaced anchors several times, and continue to the nearest corner attachment cam buckle.

A further advantage of this invention is the means in which it is secured. Cam buckles are used at all six points of suspension, which eliminates the need of tying knots. This allows for quicker set-up as well as allowing for quick and easy adjustments.

Another attribute of the invention is the means by which it can be packed and transported with ease. Both the tent pole configurations, which support the raincover and mosquito netting, as well as the lateral spreader-poles, are collapsible in to one to two foot sections. Further, these poles all have a sock cord which runs internally through them. These qualities allow for easy assembly, disassembly, packing for hikers, and storage.

A further objective of this invention is to provide a means by which to attach and remove the raincover from the hammock without having to remove oneself from bed. The raincover is held in place by six clips, one in each corner as well as one at each lateral extreme of the hammock. The raincover is also connected to a string, which circles the hammock structure longitudinally in a vertical plane. The access to both the clips and the string is through a zipper window at both ends of the hammock shelter. Hence, the raincover is retracted by releasing three clips at one end of the bed and pulling the string, which in turn draws the raincover over to the other side. To reattach the raincover, one pulls the string in the opposite direction until the raincover is in position, and then reattaches each clip, securing it in place.

Another objective of the invention is to be able to set the shelter up directly on the ground or on a ground sheet without the use of spaced anchors. This is of great advantage should there be nothing suitable to suspend the hammock shelter. In such a case, the ground will provide the support while the mosquito net and the raincover are supported by the collapsible tent poles.

Another attribute of this invention is that it does not require additional attachment to the ground or to objects at the lateral side(s) of the shelter to stabilize the structure or spread its flooring. However, it is possible to stake out both the suspended hammock shelter's raincover, as well as the ground resting shelter's raincover to the ground in case of high winds or other severe weather.

A further advantage of this invention is that it is a multi-directional hammock, allowing persons to enter from either side and lay with head at either end. This is helpful because it takes no consideration of

orientation when set-up and therefore less time to set-up. In addition, this design allows users greater individual freedom with each side of the hammock having its own vestibule space.

DESCRIPTION OF DRAWINGS

The concept and practical aspects of the invention are apparent from the purely exemplary, and therefore not restrictive, embodiments illustrated in the following examples, in which;

FIG. **1** illustrates a perspective view of base of hammock

FIG. **2A** illustrates a bottom view of hammock

FIG. **2B** illustrates a bottom view of hammock with inserted collapsible spreader pole

FIG. **3** illustrates an exploded view of main lines located at end of hammock

FIG. **4** illustrates an exploded view of corner of hammock

FIG. **5** illustrates a top view of tent pole configuration and raincover outline in comparison to bed outline

FIG. **6A** illustrates a perspective view with raincover retracted

FIG. **6B** illustrates a perspective view with raincover rolled-up

FIG. **6C** illustrates a perspective view of shelter fully staked out

LIST OF REFERENCE NUMERALS

12 spaced anchor
14 hammock
16 fabric bed
18 reinforced corner
20 stabilizer line
22 elevated connecting point
24 cam buckle
26 static sheave
28 spreader-pole retaining pocket
30 reinforcing strap
32 collapsible spreader-pole
34 raincover clip
38 main tensioning strap
40 raincover string hole
42 tent-pole hole
44 collapsible tent-pole
46 raincover
48 tent-pole clip
50 mosquito netting
52 raincover string
54 storable raincover flap
56 mosquito net zipper door
58 mosquito net zipper window
60 tent-pole pocket
62 apex attachment
64 elastic strap
66 rolled raincover flap
68 apex slip
70 tent stake loop
72 raincover entrance zipper
74 retractor attachment

DESCRIPTION OF INVENTION - MAIN EMBODIMENT FIG 1-4

In reference now to the drawings, in particular to FIG. 1 thereof, as shown a hammock **14** comprises of a fabric bed **16** dimensioned to provide accommodation for one or more persons. Said bed **16** being made from a material of sufficient strength and resilience to withstand an appropriate load and repeated use under varying conditions. Said bed **16** is connected to a main tensioning strap **38** which would be made of rope nylon or polyester strap or a similar substance with similar qualities. Said strap **38** is connected at each longitudinal end. Said main strap **38**, joins said bed **16** to spaced anchor **12** at each end. At one end, said main strap **38** wraps anchor **12** and is secured through cam buckle **24**. At the other end, said main strap **38** wraps anchor **12**, runs through sheave **26**, back around said anchor **12**, and is secured through cam buckle **24**. The preferred embodiment of sheave **26** is that of a welded D ring but other objects functioning as pulleys can be used. Stabilizer line **20** joins reinforced corner **18** of said bed **16** at four places by cam buckle **24** to anchor **12** at elevated point **22**. This connection is made by wrapping said line **20** around said anchor **12** multiple times. Length at each end of said line **20** is saved to reach nearest cam buckle **24** located on corner **18**.

FIG. **2A** illustrates hammock **14** from below. Reinforcing strap **30** follows curve from reinforced corner **18** until it separates from bed **16** and becomes main tensioning strap **38**. A spreader-pole retaining pocket **28** is connected to each corner **18**. Joined to said retaining pocket **28** is a raincover clip **34**.

FIG. **2B** shows hammock **14** from below with a collapsible spreader-pole **32**, each end of which is inserted into retaining pocket **28**. Collapsible spreader-pole **32** has a shock cord internally connecting it together.

FIG. **3** shows an exploded view of hammock **14** at one end. Reinforcing strap **30** comes to a point at the end of bed **16** and continues away from said bed **16** as main tensioning strap **38**. Attached to said main strap **38** is cam buckle **24**, sheave **26**, and raincover clip **34**. Located at the end of said bed **16**, where at said reinforcing strap **30** comes to a point, is a raincover-string hole **40**.

FIG. **4** shows an exploded view of reinforced corner **18**. Reinforcing of said corner **18** is done by means of connecting multiple layers of cloth or strap to corners of bed **16**. Cam buckle **24** attaches to said reinforced corner **18**. Spreader-pole retaining pocket **28** is joined to reinforced corner **18** and to reinforcing strap **30**. Connected to said retaining pocket **28** is a raincover clip **34**, and piercing it is a tent-pole hole **42**.

ADDITIONAL EMBODIMENTS FIG 5-6C

FIG. **5** illustrates hammock **14** from above showing a collapsible tent-pole **44** configuration. Said tent-pole **44** has shock cord connecting it together. An outline of a raincover **46** and fabric bed **16** is shown. Said tent pole **44** meets with the fabric bed **16** by way of tent-pole hole **42** located in each reinforced corner **18** of said bed **16**. Collapsible tent-pole **44** that crosses hammock **14** laterally is held in place by a tent-pole pocket **60**, which is located in two places on raincover **46**. Said collapsible tent-pole **44** that crosses said hammock **14** laterally is also held in place by an apex slip **68** located at the apex of said raincover **46**.

FIG. **6A** shows a perspective view of hammock **14**. Collapsible tent-pole **44** with ends in tent-pole hole **42** diagonally cross bed **16**. One collapsible tent-pole **44** is shown erected at the far end of said hammock **14** connected to the underside of raincover **46**. Said raincover **46** is depicted in FIG. **6A** as retracted and laying at far end of said hammock **14**. Mosquito netting **50** connected to the fabric bed **16** encloses said bed **16**. Said netting **50** is lifted into position by tent-pole clips **48**, which are connected to tent pole **44** in a plurality of places. The apex of said netting **50** is connected to the apex of crisscrossing tent-poles **44** by means of an apex attachment **62**. Said attachment **62** is an elastic band having a portion of hook and loop material at its end. Said attachment **62** is long enough to encircle said tent-poles **44** several times where said poles **44** cross at the apex. Said attachment **62** connects to itself by means of said hook and loop attachment. Mosquito netting **50** has several portals. A mosquito netting zipper door **56** is placed on both lateral sides of hammock **14**. A mosquito netting zipper window **58** is placed on both longitudinal ends of hammock **14**. As depicted in FIG. **6A**, mosquito netting door **56** and window **58** may be held open by way of an elastic retainer **64**. Also depicted in FIG. **6A** is a raincover string **52**, which completely encircles hammock **14** in a generally vertical plane. Said string **52** runs through raincover string hole **40**, each of which is located at the longitudinal ends of bed **16**. String **52** is connected in a temporary fashion to the end of raincover **46** and is gained access to through the mosquito netting window **58**. Also in this perspective view is a storable raincover flap **54**. Said flap **54** is attached to the underside of fabric bed **16** and held in a rolled manner with an elastic retainer **64**.

FIG. **6B** shows a perspective view of hammock **14** similar to that of FIG. **6A**. The major distinction is that raincover **46** is attached, which encapsulates mosquito netting **50**. Said raincover **46** is connected to all four reinforced corners **18** by raincover clips **34**. In addition, said raincover **46** is connected to reinforcing strap **30** along the longitudinal center at each end by raincover clip **34**. (this clip **34** is shown in detail in FIG. **3**) FIG. **6B** shows tent pole **44** arching perpendicular to the longitudinal line of hammock **14**. Said tent pole **44** is held in position by tent-pole pocket **60** and apex slip **68** which is connected to raincover **46**. Said pole **44** over-hangs the side of the fabric bed **16**. (see FIG. **5**) Rolled raincover flaps **66** are secured by an elastic retainer **64**. Said retainer **64** is permanently attached to raincover **46**.

FIG. **6C** shows a perspective view of hammock **14** with raincover **46** and storable raincover flaps **54** fully unrolled. As depicted in the cut away view, raincover **46** is held out of contact with the mosquito netting **50**. A raincover entrance zipper **72** runs from the tent-pole pocket **60** vertically downward on each lateral side. Inside said zipper **72** is a vestibule area between the sides of the raincover **46** and the fabric bed **16** large enough to fit a standing person. The storable raincover flaps **54**, which are not directly connected to the raincover **46**, meet said raincover **46** when extended and staked to the ground with said raincover **46** by means of a tent stake put through tent stake loop **70**. Said loop **70** is located on all grounded corners of said raincover **46** as well as said flaps **54**.

ADVANTAGES

From the description above, a number of advantages of the multiple person hammock shelter with retractable raincover become evident:

(a) A lightweight hammock with structural integrity can be made easily.

(b) Parts for fabrication are relatively easy to obtain.

(c) The fabrication of the invention can be carried out mainly by use of a sewing machine.

OPERATION OF MAIN EMBODIMENT FIG 1-4

The manner in which one would use the multiple person hammock shelter with retractable raincover is similar to that of standard hammocks only in that it is suspended between to spaced anchors, such as trees. Technically, as shown in FIG. **1**, hammock **14** functions in a unique manner. This is as described in the following: Main tensioning strap **38** removes all slack from fabric bed **16.** Strap **38** at the far end wraps anchor **12** and is secured with cam buckle **24.** Strap **38** at near end wraps anchor **12,** runs through static sheave **26,** back around said anchor **12,** and is secured with cam buckle **24.** (parts shown in detail in FIG. **3**) This said arrangement of the strap **38** at the near end creates a 4:1 mechanical advantage when tensioning hammock **14.** Said arrangement with said advantage offers the means for a lay person to stretch and tension fabric bed **16** to that four times their strength, thus creating a flat taut surface.

Stabilizer line **20** joins individual reinforced corner **18** of hammock **14** in four places to elevated point **22** on anchor **12.** This prevents hammock **14** from tilting under the weight of a load to one side or the other. Said lines **20** can be adjusted to influence the lay of a load. Stabilizer lines **20** are held laterally away from the longitudinal center by means of collapsible spreader-pole **32.** (shown in FIG. **2B**) Said pole **32** fits into spreader-pole retaining pocket **28** at each end, thus connecting it to reinforced corner **18,** and thereby connecting it to the reinforcing strap **30.**(best shown in FIG **2A**) Said strap **30** functions to transfer load stresses delivered by the main tensioning strap **38** across the entire end of fabric bed **16.** Specifically, this is done in a way that, as hammock **14** is tensioned, a more direct pull is gained through the longitudinal center. This pull diminishes gradually towards the lateral sides, as reinforcing strap **30** angles away from the centerline. The greater the load placed on hammock **14** the more the load tends to move away from the longitudinal center. Stabilizer lines **20,** having an elevated advantage, counter the tendency of a load leaving hammock **14** altogether by retaining the sides at a static level. Thus, the greater the load placed along the lateral sides of hammock **14** the more it tends back towards the center. Therein, an environment is created in which two persons may lay side by side having no tendency to either roll towards or away from one another.

OPERATION OF ADDITIONAL EMBODIMENT FIG 4-6C

The manner of using hammock **14** as a shelter utilizes a collapsible tent-pole **44** having shock cord to aid in organization and assembly time. Said pole **44** shown in plurality in FIG. **5** functions to hold enclosure shape, suspend mosquito netting **50,** and support raincover **46,** while remaining light and packable. Said pole **44** contacts fabric bed **16** through an insertion into said tent-pole hole **42,** (FIG. **4**) which happens in each of the four corners. When hammock **14** is used as a tent, pole **44** helps to maintain a spread floor. Tent-pole **44,** one

of which arches laterally across the center of hammock **14** as shown in FIG. **5**, is not connected directly to bed **16**, but to raincover **46**. This connection to said raincover **46** is at apex slip **68** and at said raincover's **46** ends by way of tent-pole pocket **60**. In this way of connection, said pole **44**, which arches laterally, is enabled to slide longitudinally to either end of bed **16** with raincover **46**. Acting as a guide and tractor for said raincover **46** is raincover string **52** (best illustrated in FIG. **6A**). Said string **52**, which runs through string hole **40** at each end, encircles hammock **14** allowing a person at either end of bed **16** to operate said string **52** through the mosquito netting window **58**. Said string is connected to raincover **46** at tractor attachment **74**. Once raincover clips **34** are released, one is free to pull string **52**, which pulls raincover **46** over the apex and on to the other side. Said string **52** functions to recover mosquito netting **50** with said retracted raincover **46** by means of pulling string in the opposite direction. Once said raincover **46** is pulled over covering mosquito netting **50** (shown in FIG. **6B**) it is clipped to reinforced corner **18** and to the longitudinal center's end by raincover clip **34**. This secures raincover **46** into position. In the action of retracting and attaching raincover **46**, tent-poles **44** which crisscross to opposite side tent-pole holes **42** act as a guide, channeling both string **52** and raincover **46** in the proper direction. If one desires additional protection, rolled raincover flaps **66** and storable raincover flaps **54** can be unrolled and staked to the ground as depicted in FIG. **6C**. This creates a vestibule area inside raincover-zipper entrance **72** and a more weather resistant environment under fabric bed **16**.

DESCRIPTION AND OPERATIONS OF ALTERNATIVE EMBODIMENTS

One alternative embodiment of the multiple person hammock shelter with retractable raincover is that it may be set up on the ground as a tent. To do this a ground sheet could be laid down on which to set the shelter. Another alternative is to place rollable-raincover flaps **66** and storable-raincover flaps **54** flat under bed **16**, thus, creating a water-resistant layer under the fabric bed **16**. Additional tent stake loops **70** located along raincover zipper entrance **72** will make the staking of the shelter possible, thus creating vestibule space under raincover **46** on the sides of bed **16**.

Another alternative embodiment of the multiple person hammock shelter with retractable raincover is that it may be used as a multiple person hammock without a mosquito netting enclosure or a raincover.

CONCLUSION, RAMIFICATIONS AND SCOPE OF INVENTION

Accordingly, the reader will see that the multiple person hammock shelter with retractable raincover of this invention can be easily used to achieve a high degree of comfort.

Furthermore, the invention has the additional advantages in that:

- It is easily and quickly set up and taken down.
- It avoids the use of multiple lines that would become entangled easily.
- It is easily and quickly adjusted with the aid of cam buckles.

- The highly tensioned bed keeps unwanted sag to a minimum, saving one's lower back, knees, and heels from unnecessary pain.
- Its unique tensioning system allows two people to lay side by side and not roll into one another, which is a common trait among most other hammocks.
- Its outer stabilizer straps can be adjusted easily to perfect individual comfort levels.
- It utilizes a system to apply or remove a raincover in which the user will not have to leave the comfort of his/her bed to enact.
- It is constructed with mosquito netting which encompasses the entire upper dome, allowing for the greatest visibility.
- It allows persons to enter or exit from either side, which aids in convenience in setting up the hammock.
- It allows a person to stand up inside vestibule area, which aids in changing cloths.
- It allows persons to sit on edge of bed without tipping bed, which aids in changing cloths and also aids those persons less flexible.
- Its double-pulley system allows one with less than average strength to tension bed tautly.

While the above description contains many specificities, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible. For example:

- Collapsible spreader-pole **32** could be located above fabric bed **16** rather than below as pictured.
- Said pole **32** could be housed in a sheath securing pole **32** inside rather than using retaining pockets **28**
- The longitudinal ends of the hammock could be attached to spreader-pole **32** as could main tensioning strap **38** be attached directly to spreader pole **32.**
- A raincover and mosquito netting could be suspended from the spaced anchor rather than supported by tent poles.
- Main tensioning strap **38** can and is suggested to be used in combination with a slippery piece of fabric placed on anchor **12** where straps **38** wrap around. This both protects surfaces and lessens friction on surfaces when tensioning hammock **14.**
- The mechanical advantage gained by wrapping main tensioning strap **38** around spaced anchor **12** could be built upon by using another static sheave **26** and wrapping said anchor **12** a third time. This would result in increasing said mechanical advantage.

Thus, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.